
SCIENCE STANDARD 7

All students will investigate the diversity of life.

INTRODUCTION

This standard expands students' biological understanding of life by focusing on diversity, evolution, and heredity. The concept of diversity provides a foundation on which students build an understanding of evolution and genetics. To achieve this standard, students explain the natural variation that exists in all living things.

Evolution is the central theme of biological science. The mechanism of evolution is natural selection. The raw materials for this mechanism are mutations, and these mutations can be passed from one generation to another by reproduction. Reproductive success ensures adaptation to a changing environment. Students should be able to explain the genetic basis for evolution.

To relate evolution, reproduction, and adaptation, this standard explores principles of heredity. The inheritance of traits is explained through the basic laws of genetics, and DNA is presented as the molecule of heredity. Expanding on Standard 5.6 ("Science Standard 6"), students are able to explain why the presence of DNA is a fundamental feature of living things. The role of DNA in natural selection is explored.

DEVELOPMENTAL OVERVIEW

In grades K-2, children observe the variety of life. They begin to recognize relationships by identifying similarities and differences of familiar things. In grades 3-4, children develop grouping schemes for seeds, leaves, and seashells. In grades 5-6, students use binary keys for classification and develop their own grouping systems. Diversity is investigated in grades 7-8 by examining animal skeletons and types of flowers. At the high school level, diversity is explained by genetic variation.

In the primary grades (K-4), simple observations introduce the concept of variation within a species, a central theme of evolution. In grades 5-6, students investigate how changing environmental conditions result in the evolution of a species. The peppered moth is used as an example. Students in grades 7-8 use the fossil record to trace the evolution of the horse, and natural selection is explained in terms of survival of the fittest. In grades 9-12, students evaluate evidence for evolution by investigating the finches of the Galapagos and the amino acid sequences of hemoglobin molecules.

Genetics is introduced in the primary grades by recognizing that offspring resemble their parents. Children in grades 5-6 distinguish between acquired and inherited characteristics, and the role of genes in inheritance is explored. In grades 7-8, students use genetics to explain patterns of human inheritance, and they relate genetics to evolution. At the high school level, students construct their

understanding of the molecular basis of heredity by building models of DNA. The processes of duplication, transcription, and translation are related to biotechnology.

Descriptive Statement: The study of science must include the diversity, complexity, and interdependence of life on Earth. Students should know how organisms evolve, reproduce, and adapt to their environments. *Science Standards 6 and 7* serve to define the fundamental understandings of the life sciences.

CUMULATIVE PROGRESS INDICATORS

By the end of Grade 4, students

1. Recognize the diversity of plants and animals on Earth.
2. Develop a simple classification scheme for grouping organisms.
3. Recognize that individuals vary within every species.
4. Identify and describe external features of plants and animals that help them survive in varied habitats.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students

5. Illustrate how the sorting and recombining of genetic material results in the potential for variation among offspring.
6. Compare and contrast acquired and inherited characteristics.
7. Classify organisms by their internal and external characteristics.
8. Discuss how changing environmental conditions can result in evolution of a species.
9. Recognize that individual organisms with certain traits are more likely to survive and have offspring.
10. Describe how information is encoded in genetic material.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students

11. Explain how DNA can be altered by natural or artificial means to produce permanent changes in a species.

12. Explain that through evolution the Earth's present species developed from earlier distinctly different species.
13. Explain how the theory of natural selection accounts for an increase in the proportion of individuals with advantageous characteristics within a species.

LIST OF LEARNING ACTIVITIES FOR STANDARD 7

GRADES K-4

Indicator 1:

GRADES K-2

Picture Safari

GRADES 3-4

Mini Habitats

Indicator 2:

GRADES K-2

Mixed Seeds and a Shoe Pile

GRADES 3-4

Classifying Seashells and Other Things

Indicator 3:

GRADES K-2

Observing Variation within a Species

GRADES 3-4

Peanuts and Leaves

Indicator 4:

GRADES K-2

Searching for Food

GRADES 3-4

Designing Adaptations

GRADES 5-8

Indicator 5:

GRADES 5-6

Inheritance of Genetic Traits

GRADES 7-8

Documenting Variation within a Species

Indicator 6:

GRADES 5-6

Acquired or Inherited?

GRADES 7-8

Studying Inherited Traits

Indicator 7:

GRADES 5-6

Classifying Characteristics

GRADES 7-8

A Key for Grouping Organisms

Indicator 8:

GRADES 5-6

Moth Adaptation

GRADES 7-8

Evolution: Past and Present

Indicator 9:

GRADES 5-6

Bird Adaptations and Habitats

GRADES 7-8

Natural Selection

GRADES 9-12

Indicator 10:

DNA: Its Function

Indicator 12:

Evolution: Historic Case Studies

Indicator 11:

Genetic Recombination

Indicator 13:

Natural Selection Analogue

Indicator 1: Recognize the diversity of plants and animals on Earth.

LEARNING ACTIVITY: Grades K-2

Picture Safari. Students create “picture safaris” by cutting out pictures of plants and animals from various habitats. After this introduction to the diversity that exists in nature, they role-play the different feeding levels of organisms. They can create masks to identify the kind of animal or plant they are imitating. By talking about where they live and how they get food, students easily recognize the differences between them.

Supporting Educational Research: *Benchmarks*, pp. 102, 116
Related Science Standards: 6, 12
Related Workplace Readiness Standards: 3.2, 4.7, 5.6, 5.7

LEARNING ACTIVITY: Grades 3-4

Mini Habitats. Students create simple quadrants of living things by pulling a hanger into a diamond shape and laying it on the ground. Within these quadrants, they look for different types of animal and plant species. Students can set up quadrants in different habitats and compare the results.

As a mathematical extension of this activity, students can use population statistics.

Supporting Educational Research: *Benchmarks*, p. 103 (5A)
Related Science Standards: 5, 6, 12
Related Workplace Readiness Standards: 3.7, 3.8

Indicator 2: Develop a simple classification scheme for grouping organisms.

LEARNING ACTIVITY: Grades K-2

Mixed Seeds and a Shoe Pile. A bag of mixed seeds—including different kinds of beans, peas, and nuts—is a simple way to introduce the concept of grouping like things. Students can easily observe differences in color, shape, and texture.

Creating a “shoe pile” from students’ shoes also helps improve observation of detail for classification.

Supporting Educational Research: *Benchmarks*, p. 116
Related Science Standards: 2, 6, 12
Related Workplace Readiness Standards: 3.7, 3.8, 3.9

LEARNING ACTIVITY: Grades 3-4

Classifying Seashells and Other Things. Seashells come in a wide variety of colors, shapes, and sizes. To practice using a simple classification technique, students sort shells into categories.

Using cutout shoe boxes, students make panoramas representing different types of habitats, such as a pond, an ocean, a desert, or a forest. Give students an assortment of plant and animal pictures. They can then determine which organisms belong in which habitat.

Supporting Educational Research: *Benchmarks*, p. 103
Related Science Standards: 2, 6, 12
Related Workplace Readiness Standards: 3.2, 3.8, 3.12

Indicator 3: Recognize that individuals vary within every species.

LEARNING ACTIVITY: Grades K-2

Observing Variation within a Species. Last year's calendars with pictures of puppies, kittens, or horses on them help children recognize differences in organisms of the same species. Children can describe what makes their particular kitten or puppy different from the rest.

Potatoes can be used to show differences within a plant species. Each child "adopts" a potato and carefully examines it. Several children place their potato in a box at the same time, and then see if they each can recognize which potato is theirs.

Supporting Educational Research: *Benchmarks*, p. 102 (5A)
Related Science Standard: 6
Related Workplace Readiness Standards: 3.7, 3.9

LEARNING ACTIVITY: Grades 3-4

Peanuts and Leaves. A small collection of 25 unshelled peanuts or 25 leaves from the same tree help students quantitatively determine how individuals within a species vary. By weighing the peanuts or measuring the length of each leaf, students see that they are not all the same size. Tallying those with common weights or lengths, students can create bar graphs to illustrate similarities and differences.

Supporting Educational Research: *Benchmarks*, p. 103 (5A)
Related Science Standards: 2, 6
Related Workplace Readiness Standards: 3.3, 3.9, 3.12

Indicator 4: Identify and describe the external features of plants and animals that help them survive in varied habitats.

LEARNING ACTIVITY: Grades K-2

Searching for Food. In this activity, students explore adaptations for survival. First, each student selects a small, roped-off area of grass in which to drop prey. Then they toss candies of different colors (including green and red) randomly into the plot. During a brief “hunting season,” students search their respective areas for as many candies as they can find. Afterward, discuss with the class what makes some candies harder to find than others. Ask the students which were the easiest to find.

Hang posters of several different habitats on the walls around the classroom and give students pictures of different plants and animals. They place the pictures on the correct posters and explain why that habitat is where the organism would live.

Supporting Educational Research: *Benchmarks*, p. 102
 Related Science Standard: 12
 Related Workplace Readiness Standards: 3.2, 3.6, 4.2

LEARNING ACTIVITY: Grades 3-4

Designing Adaptations. Seeds are dispersed in a variety of ways. Each student selects a method of dispersal and designs a seed that will be successfully dispersed by that method. They test their designs using a small fan, a pan of water, or a piece of fuzzy material.

As another challenge to their creativity, give students a description of an unknown planet, and ask them to design a creature that would be able to survive on that planet. Encourage students to consider those creatures that live underground, in water, and on land.

Supporting Educational Research: *Benchmarks*, p. 103
 Related Science Standards: 2, 6, 12
 Related Workplace Readiness Standards: 3.6, 3.12, 3.16

Indicator 5: Illustrate how the sorting and recombining of genetic materials results in the potential for variation among offspring.

LEARNING ACTIVITY: Grades 5-6

Inheritance of Genetic Traits. This exercise introduces students to the concept of dominance in the transmission of genetic traits. In prelab discussion, students learn that in sexually reproducing organisms half of the genes are inherited from each parent and that genes carry the genetic code. They review the contributions of Gregor Mendel and his famous pea plants.

Working individually or in small groups, students begin with 24 blue opaque disks, 24 transparent disks, and four paper bags. They label each of the paper bags as “Pure Blue Parent,” “Pure Transparent Parent,” “First Generation,” or “Second Generation.”

The students place two blue disks together, one on top of the other, and hold them up to the light. They observe and record the color of the two disks while held together, and then place these disks into the bag labeled “Pure Blue Parent.” The students repeat this procedure until all of the blue disks are in that bag. They carry out the same procedure for the transparent disks until they all end up in a bag labeled “Pure Transparent Parent.”

Next, students remove one disk from the “Pure Blue Parent” bag and one disk from the “Pure Transparent Parent” bag. They place these two disks together and hold them up to the light. They observe and record the resultant color, and then place these two disks in the bag labeled “First Generation.” The students continue removing one disk from each “parent” bag, holding them together under the light, recording their observations, and then placing them in the “First Generation” bag.

When the students have paired (and relocated) all of the disks in this way, they close the “First Generation” bag and shake it. Blindly and randomly, the students pick two disks from the bag, hold them together under the light, and observe the resultant color. They record the color when thus combined, as well as the color of each of the two disks, and place the two disks into the bag labeled “Second Generation.” The students continue until they have taken out all of the disks from the “First Generation” bag. If the data sheets are properly constructed, the results should lead to an interesting discussion of dominant and recessive genes, and perhaps also probability.

Supporting Educational Research: *Benchmarks*, p. 341;
 Fulfilling the Promise, pp. 18-20
 Related Science Standards: 2, 5
 Related Workplace Readiness Standards: 2.1, 3.12

LEARNING ACTIVITY: Grades 7-8

Documenting Variation within a Species. Students investigate variation within a species by identifying a characteristic they can easily measure. Working in groups, they study individual variations in size among plant populations and interpret the data by statistical methods.

First, they obtain a sample of about 50 dried bean seeds or unshelled peanuts. They measure the length of each seed to the nearest millimeter. Using the length data, students construct a frequency distribution table and a bar graph (with intervals on the horizontal axis and the frequency on the vertical axis). They calculate the mean, median, and mode for their data. Students can pool their group data into class data and construct a more comprehensive bar graph. They can use computer graphing to compare and present data. For additional experience, student groups might swap samples with each other and remeasure the seeds.

This time of development for middle school students lends itself to human biology. Variations in the students' height or distance between the eyes might be considered as an extension activity.

Supporting Educational Research:
National Science Education Standards, p. 156;
Fulfilling the Promise, p. 19
Related Science Standards: 2, 5
Related Workplace Readiness Standards: 2.7, 3.7, 3.9

Indicator 6: Compare and contrast acquired and inherited characteristics.

LEARNING ACTIVITY: Grades 5-6

Acquired or Inherited? The distinction between acquired and inherited characteristics is central to evolution and genetics. Explain the distinction to the students and give examples of each. A possible example is shaving one's head vs. male pattern baldness. Both lead to bare heads, but the first is acquired and the second is inherited.

Each cooperative learning group comes up with as many acquired and inherited characteristics found in humans as possible. After compiling these two lists of characteristics, the groups come together and compare lists. Discussion can bring out interesting features to help students compare and contrast the two types of characteristics.

(These lists might be interesting to keep for 10 to 20 years. Science changes and so will what we know about genetics today.)

Supporting Educational Research: *Benchmarks*, p. 341;
Fulfilling the Promise, pp. 18-20
Related Science Standard: 6
Related Workplace Readiness Standards: 3.8, 3.14, 4.2

LEARNING ACTIVITY: Grades 7-8

Studying Inherited Traits. Some students of all ages believe that certain environmentally produced characteristics can be inherited over several generations. To address this misconception, students need to distinguish between traits that are inherited and those that are acquired. Acquired characteristics in humans are easily identified. For example, hair color can be changed with the use of dyes; the appearance of teeth can be altered with braces. Other examples of acquired characteristics can be found in domesticated animals. The tails of some dogs are removed; pets are trained to eat food that would not be a natural source of nourishment.

To investigate examples of inherited characteristics, students study

- foot and beak adaptations of birds
- neck length in giraffes
- flower color, leaf arrangement, or seed shape in plants
- hair color, eye color, tongue rolling, shape of earlobes, color blindness, and dimples in humans (e.g., themselves)

As an enrichment activity, students investigate the development of twins. They research studies of twins that are separated at birth and then draw conclusions about acquired vs. inherited characteristics.

Supporting Educational Research: *Benchmarks*, p. 341;
 Fulfilling the Promise, p. 19
 Related Science Standards: 2, 6, 12
 Related Workplace Readiness Standards: 3.7, 3.12, 3.14

Indicator 7: Classify organisms by their internal and external characteristics.

LEARNING ACTIVITY: Grades 5-6

Classifying Characteristics. Students practice classifying species by using a binary (dichotomous) key. The entire class divides into two categories based on external characteristics, for example, male vs. female, blonde hair vs. other, brown eyes vs. other. Within each category, students create more groups with distinct characteristics and divide until every student is standing alone. Next, each student traces back the characteristics. For example, Bob is wearing a belt, belongs to a group wearing blue jeans, belongs to a group with brown hair, belongs to a group with brown eyes, and is a male.

Careful consideration should be given to the selection of categories so that students are not offended or embarrassed during this activity.

As an extension activity, students examine or design keys for trees, rocks, shells, etc.

Supporting Educational Research: *Benchmarks*, p. 340

Related Science Standard: 2

Related Workplace Readiness Standards: 3.9, 4.2

LEARNING ACTIVITY: Grades 7-8

A Key for Grouping Organisms. Similarities and differences in structure are the basis for classifying living things. The investigation of animal skeletons is a fun way to continue the development of classification schemes. Students first generate a list of animals. From this list, they identify animals with an internal skeleton and those with an external skeleton. This characteristic leads to a discussion of vertebrates and invertebrates. Afterwards, students examine and compare internal characteristics by dissecting specimens, studying models, or using computer simulations.

Students collect plants from the school grounds and categorize them by type of venation, presence of flowers, or arrangement of leaves.

To further refine their skills of observation and classification, students can use dichotomous keys to classify insects, fish, birds, or trees.

Supporting Educational Research: *Benchmarks*, p. 340

Related Science Standard: 2

Related Workplace Readiness Standards: 3.7, 3.9, 4.2

Indicator 8: Discuss how changing environmental conditions can result in evolution of a species.

LEARNING ACTIVITY: Grades 5-6

Moth Adaptation. Students graph and interpret changes in color among the peppered moth population near Manchester, England, during the Industrial Revolution. These variations show evolutionary adaptation to the environment.

Before 1845, the light-colored variety was common, and darker individuals were rare. During the 10-year study, the numbers changed considerably. Apparently, the moths were active at night and rested on tree trunks during the day, where they were eaten by birds. The trees had light-gray trunks at the beginning of the study, but the trunks got darker during the period as a result of factory pollution and coal burning.

Moth population data can be easily found in most high school biology texts. Students graph and interpret the data, attempting to answer the question, “What appears to be the connection?”

Supporting Educational Research: *Benchmarks*, p. 34
 Related Science Standards: 1, 2, 5
 Related Workplace Readiness Standards: 2.4, 2.6, 3.2

LEARNING ACTIVITY: Grades 7-8

Evolution: Past and Present. Evidence that modern species evolved from ancient organisms can be found in the fossil records. Using reference materials, diagrams, charts, and illustrations, students work in cooperative groups to discuss how the horse changed over time. Each group prepares a chart illustrating the changes in size, leg anatomy, and tooth anatomy that occurred due to change of climate, terrain, and diet. Students present their report and illustrations to the class for evaluation. Other organisms that students can study in a similar manner are the giraffe, the elephant, snails, and the New Jersey pitch pine.

As an extension of this activity and as a way to show the ongoing nature of evolution, students use various telecommunication techniques to connect with environmental classes and other research agencies throughout the nation. They use the data obtained to analyze the effect of environmental changes on living organisms. They learn about changes such as the following:

- During ecological pond studies, students in a midwestern state found multi-appendaged frogs in several ponds in their community.
- In Florida, cockroaches became resistant to a poisonous bait that previously had killed them.

By sharing research information in this way, students can use the data to discuss the impact of environmental changes on organisms. Schools can develop data exchanges in written communications.

Supporting Educational Research: Fulfilling the Promise, pp. 23-24;
National Science Education Standards, pp. 156-158
Related Science Standards: 1, 2, 12
Related Workplace Readiness Standards: 3.3, 3.13

Indicator 9: Recognize that individual organisms with certain traits are more likely to survive and have offspring.

LEARNING ACTIVITY: Grades 5-6

Bird Adaptations and Habitats. Adaptations are the special inherited characteristics of an organism that make it suited to survive in a particular habitat. An adaptation may be structural (e.g., crab claws, fish fins), chemical (e.g., an enzyme), or behavioral. Beak and foot adaptations in birds are structural adaptations that are relatively easy for students to see and study.

Students begin their study of bird adaptations with appropriate reference books and pictures of various types of bird beaks and feet. They examine charts matching beak types with the functions (usually food-related) that they enable the bird to perform. Then they look at pictures of birds' heads and determine what type of beak each has and the type of habitat for which each bird is suited. Is that, in fact, where these birds are found? Students can repeat this process, "adapting" it to birds' foot types.

For a hands-on extension activity, students try food gathering as if they were a bird. They use the assigned tools to gather their "food" (see list below).

- *Fish eater*—large forceps; plastic fish floating in a large bowl of water
- *Meat eater*—staple remover; stuffed mice
- *Insect eater*—chopsticks; gummy bears
- *Seed eater*—paper plate of popcorn (students' hands behind their backs)
- *Fruit eater*—melon-ball scooper; grapes
- *Grain eater*—toothpicks taped to fingertips; uncooked rice sprinkled into crevices of bark

Supporting Educational Research: *Benchmarks*, p. 343;
National Science Education Standards, pp. 18-20
Related Science Standard: 12
Related Workplace Readiness Standards: 3.9, 3.12

LEARNING ACTIVITY: Grades 7-8

Natural Selection. Students construct their understanding of natural selection in relation to the survival of the fittest (the strong survive and the weak die). To apply this principle of natural selection, students examine pictures of plants and animals. They describe unique features that help organisms to survive. Examples might include the following:

- the white fur of a polar bear
- the prehensile tail of a monkey
- the spine of a cactus

A field trip to a zoo, the New Jersey State Aquarium, or Liberty Science Center is an exciting way to illustrate this concept.

As an alternative activity, students “design a creature.” Using clay models, drawings, cutouts, or computer graphics, the students design an imaginary plant or animal. In a written report or oral presentation, students explain the survival feature of their special creature. To extend this activity, students predict the results of a theoretical pairing of animals.

Supporting Educational Research: *Benchmarks*, pp. 343-344;
 National Science Education Standards, p. 156
 Related Science Standard: 2
 Related Workplace Readiness Standards: 2.9, 3.7, 4.2

Indicator 10: Describe how information is coded in genetic material.

LEARNING ACTIVITY: Grades 9-12

DNA: Its Function. To describe the function of DNA, students use templates or cutouts of the parts of the DNA molecule. Manipulating these models, they investigate duplication, transcription, and translation.

As an extension activity, students conduct a DNA fingerprint simulation. A specific gene pattern sequence is simulated on graph paper. Genes are numbered 1 to 7, with repeats occurring to produce a total number of 29 genes. Various combinations are produced. Students “cut” their DNA between gene 4 and gene 5 by using a “restriction enzyme.” This cut produces fragments of varying sizes. The simulated gel consists of a strip of graph paper numbered 1 to 25 (starting with the #1 at the bottom). A band is colored at the corresponding points of the genes. Using an unknown sequence, students can identify DNA fragments of a criminal and victim.

Other extension activities might include the following:

- exploring the use of DNA in forensic science
- finding career options in criminal science
- searching databases for protocols for DNA extraction

Supporting Educational Research: *Benchmarks*, p. 341 (5B);
 Fulfilling the Promise, p. 22
 Related Science Standards: 1, 3
 Related Workplace Readiness Standards: 1.3, 2.5, 2.7, 3.12

Indicator 11: *Explain that DNA can be altered by natural or artificial means to produce changes in a species.*

LEARNING ACTIVITY: Grades 9-12

Genetic Recombination. To demonstrate that traits can be acquired by genetic recombination, students culture two different strains of *E. coli* on an agar plate. One strain is ampicillin resistant; the other is streptomycin resistant. When the two cultures are grown together, conjugation occurs and a new strain forms that is resistant to both antibiotics. Students test transformations by growing colonies on plates that contain both the streptomycin and the ampicillin.

As an extension activity, students use databases to identify industrial applications of bacterial transformations such as

- the production of vaccines and synthetic drugs
- the improvement of crop resistance

Supporting Educational Research: *Benchmarks*, p. 343;
 Fulfilling the Promise, p.22
 Related Science Standards: 1, 3, 4
 Related Workplace Readiness Standards: 3.12, 5.4, 5.7

Indicator 12: *Explain that through evolution, the Earth’s present species developed from earlier and distinctly different species.*

LEARNING ACTIVITY: Grades 9-12

Evolution: Historic Case Studies. In cooperative groups, students investigate some of the classic case histories of evolution including the following:

- the peppered moths in Manchester, England
- the changes in average horse height and the size of bones in their feet over the past 60 million years
- the differences in the amino acid sequences in the hemoglobin molecules of humans, fruit flies, chimps, horses, and other organisms
- the variations in the beaks of finches in the Galapagos Islands

Students conduct their research using science software and the Internet. They present a summary of their findings in verbal, graphic, and electronic form. Afterwards, the class discusses the similarities and differences in these four cases.

About 25 years ago, the oldest intact human skeleton was discovered in Africa by Drs. Louis and Mary Leakey. As an interdisciplinary extension activity, students write a poem as the fossil “Lucy,” addressing her ancestors.

Supporting Educational Research: *Benchmarks*, p. 343
 Related Science Standard: 1
 Related Workplace Readiness Standards: 2.6, 3.8, 4.2

Indicator 13: *Explain how the theory of natural selection accounts for an increase in the proportion of individuals with advantageous characteristics within a species.*

LEARNING ACTIVITY: Grades 9-12

Natural Selection Analogue. Students use a simulation to demonstrate coloration as a result of natural selection. This activity requires only a newspaper, black and white construction paper, a large box, and scissors. Students cut the newspaper to the same size as the construction paper, then fold it into 64 rectangles that are to be cut out. In the same fashion, fold the black and white construction paper and cut out the 64 rectangles. The three types of rectangles simulate three “organisms” within the “environment,” which is a large piece of newspaper lining the bottom of the large box. Randomly, one of the students drops the organisms into the environment. Other students act as “predators” on the animals in the box. Each predator, at a glance, reaches into the box and quickly identifies and removes an organism. After each predator removes an organism, the number of each remaining organism is tallied. Based on this, students make predictions about future populations.

As a supplement to this activity, students research other populations that have been affected by natural selection.

Supporting Educational Research: *Benchmarks*, p. 343

Related Science Standard: 12

Related Workplace Readiness Standards: 2.4, 3.2, 3.3, 3.12, 3.14